



# GLOBE and Ocean Science Education

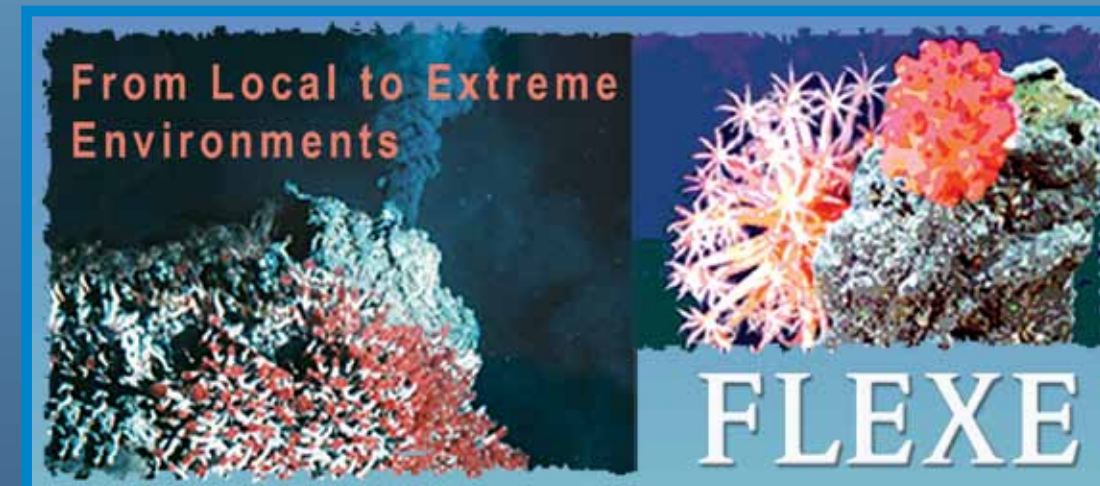
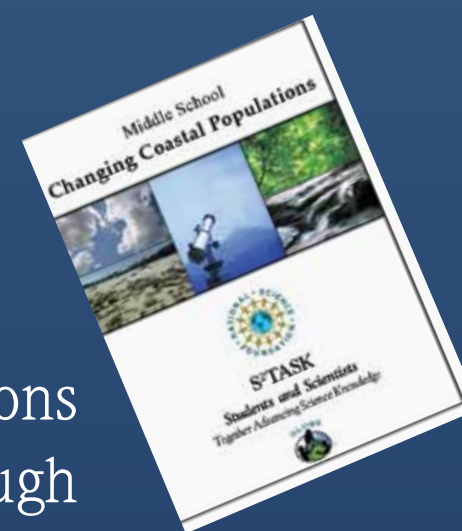
GLOBAL LEARNING AND OBSERVATIONS TO BENEFIT THE ENVIRONMENT

## Marine Hydrology Symposium

GLOBE's first Marine Hydrology Symposium took place at Western Washington University in Bellingham, Washington, USA, on July 2001. GLOBE trainers were introduced to the GLOBE marine macroinvertebrate protocols and conducted hydrology measurements in saltwater and brackish sites. GLOBE scientists presented research interests in marine biology and showed how GLOBE data contributes to a better understanding of Earth system science. The first Ocean GLOBE protocols were demonstrated/trained at this event and shared with the community.

## Thailand Marine Coastal Symposium

Highlights of the 2005 research conference included observations of coral reefs, monitoring change detection and bleaching through satellite remote sensing, field studies of reef flats, sea grass and marine macroinvertebrates using GLOBE protocols, ongoing studies of the impact of the Sumatran Tsunami and recovery of local marine coastal resources.



Call, and FLEXE Research Cruises to the hydrothermal vents of the East Pacific Rise.

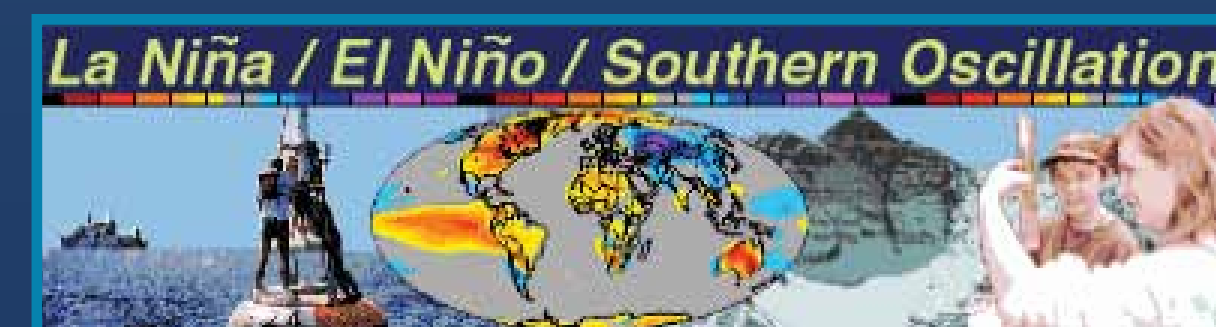


The UCLA Marine Science Center and National Science Foundation began a beach research and outdoor environmental education outreach program in 2000 for upper elementary, middle and high school students. GLOBE Students collect environmental and biological data for their science projects from a beach site close to their school campus. GLOBE students share the results of their research projects with the community.



## SeaKeepers

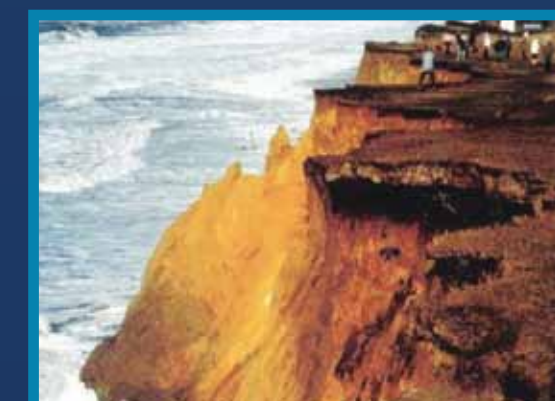
An association of entrepreneurs, yachtsmen, corporations, divers, scientists and concerned citizens committed to finding real-world solutions to the problems plaguing the world's oceans have teamed with GLOBE since 2000.



GLOBE students engage in research using EL Niño/La Niña predictions, datasets and visualizations on the GLOBE Web site since 1997, documenting long-term monthly averages of mean air temperature and total precipitation.

## Coast Watch Europe

GLOBE students undertake annual inspections of ocean and sea coast lines to monitor coastal biodiversity. German schools have been actively involved in Coast Watch Europe since 2007.



## Year of the Ocean

GLOBE students actively participated in YOTO activities in 1998.



[www.globe.gov/oceanglobe](http://www.globe.gov/oceanglobe)



## NOAA Teacher at Sea Program

Aboard NOAA research and survey ships, GLOBE teachers, partners and scientists bring their research back to the classroom.

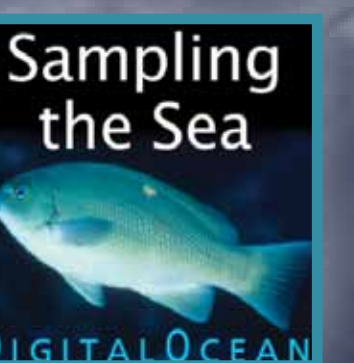
## Exploring the Celebes Sea

GLOBE Philippines students followed the progress of a joint NOAA, National Geographic Society, and Filipino deep sea expedition in 2007 to learn about a largely unexplored area in the Celebes Sea. Through Weblogs and compelling images, videos and podcasts, the Celebes Sea Expedition provided a unique opportunity for GLOBE students to become active underwater explorers alongside an international team of deep sea scientists.



## Digital Ocean

GLOBE students participated in the 2009 Sampling the Sea project, a multi-disciplinary ocean science education and social networking initiative to engage students in collecting and sharing data, images, and stories about declining global fish populations with implications for humans and oceans.



## Ocean for Life

High school students from the United States and countries from the GLOBE Near East-North Africa Region collaborate in unique educational and cultural experiences focusing on marine biology, oceanography, and the foundations of GLOBE student research. GLOBE Ocean for Life 2009 research activities took place in marine sanctuaries in Florida and California.



## National Marine Sanctuaries

National Marine Sanctuaries provide GLOBE student research opportunities in marine protected areas. Students learn to preserve the ecological integrity of valuable national resources through marine research and to maintain this cultural legacy for future generations.



## The GLOBE Program

Global Learning and Observations to Benefit the Environment



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E. Courtesy of Ocean for Life  
F. Courtesy of Van Damm, University of New Hampshire  
G. Courtesy of NOAA Teacher at Sea Program  
H. Courtesy of R. Lutz, Rutgers University; Stephen Low Productions; and Woods Hole Oceanographic Institution

